

Léa E. Bonnefoy

Curriculum Vitae

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Born on 05/02/1993
Nationality : French

Formation

- 2020 **PhD in Astrophysics**, *Observatoire de Paris*, Meudon, France.
- 2016 **Master recherche Astronomie, Astrophysique et Ingénierie Spatiale**, *Observatoire de Paris*, Paris, France.
- 2015 **Bachelor's of Arts; Major: physics**, *Cornell University*, Ithaca, NY, USA.

Research experience

- 2020 – present **Postdoctoral researcher: Understanding the dune fields of the Dragonfly landing site**, *CNES, IPGP-Université de Paris, and Cornell University*, Paris, France and Ithaca, USA.
Postdoc advisors: Antoine Lucas, Sébastien Rodriguez, and Alexander G. Hayes
- 2017 – 2020 **PhD in Astrophysics: Microwave thermal radiation from Saturn's icy moons**, *Observatoire de Paris*, Meudon, France.
PhD advisors: Emmanuel Lellouch, Alice Le Gall, and Cédric Leyrat
- 2016 – 2017 **Monitoring and analysis of hydrological changes after the Holuhraun lava flow in Iceland**, *Lunar and Planetary Laboratory (LPL)*, Tucson, AZ, USA.
Advisor: Christopher Hamilton
- Apr. – July 2016 **Enceladus in the micro-waves**, *LATMOS, Sorbonne Université*, Paris, France.
Advisors: Alice Le Gall and Cédric Leyrat
- 2014 – 2015 **Titan's dunes from Cassini VIMS and RADAR**, *Hayes Reaserch group, Astronomy department, Cornell University; Jet Propulsion Laboratory, Columbus Technologies and Services Inc.*, Ithaca, NY, USA and Pasadena, CA, USA.
Advisors: Alexander G. Hayes, Paul O. Hayne, and Michael J. Malaska
- Jan 2013 **Cataloguing extreme high-redshift galaxy clusters unveiled by Planck**, *Institut d'Astrophysique Spatiale (IAS), University Paris-Sud*, Orsay, France.
Advisor: Nicole Nesvadba
- 2012 – 2013 **Repairing, upgrading, and incorporating a stepper motor control box into the new redshift and Early Universe Spectrometer (ZEUS-2)**, *Submillimeter astrophysics group, Astronomy department, Cornell University*, Ithaca, NY, USA.
Advisor: Gordon Stacey

Teaching experience

- Apr – July 2020 **Co-supervision of Marie Azevedo's 1st year remote research internship in the master's "Planétologie Île de France"**, *LATMOS, Sorbonne Université*.
Title: Dione in the micro-waves. Co-supervisor: Alice Le Gall
- 2018 – 2020 **Online tutor, Diplôme Universitaire Lumières sur l'Univers (DU LU)**, *Observatoire de Paris*, France.
Online tutoring for the general astronomy and planetary science programs of the DU LU.
- Aug 2019 **Teaching assistant, Diplôme Universitaire Explorer et Comprendre l'Univers (DU ECU)**, *Observatoire de Paris; Observatoire de Haute-Provence*, France.
Taught and supervised astrometry with the 120-cm telescope during one week.

- Jan – May 2019 **Teaching assistant, Master's 1st year "Physique et applications"**, *Observatoire de Paris*, France.
Taught the discussion sessions of the master's quantum physics class "Intéractions milieux dilués rayonnements."
- Apr – July 2018 **Co-supervision of Robin Sultana's 2nd year research internship in the master's "Planétologie Île de France"**, *LATMOS, Sorbonne Université*.
Title: Analysis of the distant Cassini radar/radiometry observations of Titan and Saturn's other satellites. Co-supervisor: Alice Le Gall
- Feb – Aug 2017 **Volunteer, Center for English as a Second Language (CESL)**, *University of Arizona*, Tucson, AZ, USA.
Led English conversation practice for CESL students.
- Jan – May 2015 **Consultant, Computer science department**, *Cornell University*, Ithaca, NY, USA.
Tutored students and graded examinations for the classes CS1112 (Introduction to Matlab) and CS1132 (Transition to Matlab).

Outreach experience

- 2019 – present **SpaceBus France**, France, *Volunteer*.
Presented a space-themed escape game and detailed scientific concepts to the general public in different towns during the summer and at occasional events throughout the year.
- Mar. 2020 **College Jean Monnet**, Lusignan, France, *Sciences en Mouvement d'Elles*.
Discussed astronomy, career paths, and gender inequalities in astronomy with middle school students
- 2015 **Cornell/NASA Spacecraft Planetary Imaging Facility (SPIF)**, Ithaca, NY, USA.
Demonstrated astronomy concepts with middle school students and participated in updating the Sagan Planet Walk
- [Invited public talks](#)
- Aug. 2020 **Maison de la Jeunesse et des Associations**, Val-de-Reuil, France.
- Mar. 2020 **Club d'astronomie CIEL MELUSIN**, Lusignan, France, *Soirées Babinet*.
- Nov. 2019 **Association Vega**, Plaisir, France.
- Jan. 2019 **Association Française d'Astronomie (AFA)**, Paris, France.
- Oct. 2018 **Festival des 2 Infinis**, Paris, France, *Ma thèse en 5 minutes*.
- Jun. 2017 **Space Drafts at the Borderlands Brewing Company**, Tucson, AZ, USA.

Field and observation experience

- 2018 & 2019 **IRAM 30-meter telescope**, *Institut de RadioAstronomie Millimétrique*, Granada, Spain.
Observing astronomer (three times, each during a week)
Research objective: probing the subsurface of Iapetus's two faces at 1.2 and 2.0 mm
- Aug. 2016 **Holuhraun lava flow**, Iceland.
Research objective: characterizing landscape evolution after the Holuhraun 2014–2015 lava flow
- Dec. 2016 **Several parks near Orlando**, Florida, USA.
Student for University of Arizona class PTYS594: Planetary Geology Field Studies
Objective: planetary analog field studies. Individual project: examining karstic lakes as Titan analogs
- April 2015 **Mojave Desert and Death Valley**, California, USA.
Student for Cornell University class A6577: Planetary Surface Processes
Objective: ground truthing of remote sensing data and planetary analogs

Honors and awards

- October 2020 **L'Oréal-UNESCO For Women in Science young talent award**.
- 2016 – 2017 **Lt. Col. Kenneth Rondo Carson and Virginia Bryan Carson Graduate Fellowship**.

May 2015 **Cranson and Edna B. Shelley Undergraduate Research Award**, for excellency in undergraduate research in astronomy.

Skills

Programming	MATLAB, IDL	<i>experienced</i>
	LabView, Java, Python	<i>intermediate</i>
Software	L ^A T _E X, ArcGis, Microsoft Office, SPICE NAIF	<i>experienced</i>
	GMAT, Altium PCB design	<i>intermediate</i>

Languages

French	Native	English	Fluent
Spanish	Fluent	Russian	Intermediate

Publications

Journal publications

- *Rhea's subsurface probed by the Cassini radiometer: Insights into its thermal, structural, and compositional properties*
L. E. Bonnefoy, A. Le Gall, E. Lellouch, C. Leyrat, M. A. Janssen, R. Sultana – 2020, *Icarus* 352, 113947.
- *Probing the subsurface of the two face of Iapetus*
L. E. Bonnefoy, J.-F. Lestrade, E. Lellouch, A. Le Gall, C. Leyrat, N. Ponthieu, and B. Ladjelate – 2020, *proceedings of the mm Universe Conference*.
- *Dust and snow cover on Saturn's icy moons*
A. Le Gall, R. D. West, and **L. E. Bonnefoy** – 2019, *Geophysical Research Letters*, 46.
- *Landscape evolution associated with the 2014–2015 Holuhraun eruption in Iceland*
L. E. Bonnefoy, C. W. Hamilton, S. P. Scheidt, S. Duhamel, Á. Höskuldsson, I. Jónsdóttir, T. Thordarson, and U. Münzer – 2019, *Journal of Volcanology and Geothermal Research*, 387.
- *Thermally anomalous features in the subsurface of Enceladus' South Polar Terrain*
A. Le Gall, C. Leyrat, M.A. Janssen, G. Choblet, G. Tobie, O. Bourgeois, A. Lucas, C. Sotin, C. Howett, R. Kirk, R.D. Lorenz, R.D. West, A. Stolzenbach, M. Massé, A.H. Hayes, **L. E. Bonnefoy**, G. Veysière, and F. Paganelli – 2017, *Nature Astronomy* 1, 0063
- *Compositional and spatial variations in Titan dune and interdune regions from Cassini VIMS and RADAR*
L. E. Bonnefoy, A. G. Hayes, P. O. Hayne, M. J. Malaska, A. Le Gall, A. Solomonidou, A. Lucas – 2016, *Icarus* 270, 222-237.

Conference presentations

- *Dione's leading/trailing dichotomy at 2.2 cm*
L. E. Bonnefoy, A. Le Gall, M. Azevedo, E. Lellouch, C. Leyrat, and M. A. Janssen – September 2020, *EPSC 2020*, online conference.
- *Developing a new model for mesoscale and large-eddy simulations of Titan's atmosphere*
A. Spiga, M. Lefèvre, J. Vatant d'Ollone, S. Lebonnois, S. Rodriguez, A. Chatain, **L. E. Bonnefoy**, and A. Lucas – September 2020, *EPSC 2020*, online conference.
- *Saturn satellites' icy regoliths: the case of Rhea's South pole*
L. E. Bonnefoy, A. Le Gall, E. Lellouch, C. Leyrat, M. A. Janssen, and the Cassini Radar team – September 2019, *Titan after Cassini-Huygens workshop*, Madrid, Spain.
- *From Xanadu, Titan to the SPT of Enceladus: Saturn's system radar-brightest regions*

- A. Le Gall, R. D. West, **L. E. Bonnefoy**, V. Ciarletti, S. Rahmouni, and Y. Hervé – September 2019, *Titan after Cassini-Huygens workshop*, Madrid, Spain.
- *Millimetric thermal emission from the two faces of Iapetus*
L. E. Bonnefoy, J.-F. Lestrade, A. Le Gall, E. Lellouch, C. Leyrat, N. Ponthieu, and B. Ladjelate – September 2019, *EPSC-DPS 2019*, Geneva, Switzerland.
 - *Saturn's inner moons: why are they so radar-bright?*
A. Le Gall, R. D. West, **L. E. Bonnefoy**, V. Ciarletti, S. Rahmouni, and Y. Hervé – September 2019, *EPSC-DPS 2019*, Geneva, Switzerland.
 - *Probing the subsurface of the two faces of Iapetus*
L. E. Bonnefoy, J.-F. Lestrade, E. Lellouch, A. Le Gall, C. Leyrat, and N. Ponthieu – June 2019, *mm Universe @ NIKA2 Conference*, Grenoble, France.
 - *Rhea's thermal properties and regional anomalies revealed by Cassini's Radar/radiometer*
L. E. Bonnefoy, A. Le Gall, E. Lellouch, C. Leyrat, and M. A. Janssen – September 2018, *EPSC 2018*, Berlin, Germany.
 - *The geological history of Saturn's icy moons and their interaction with the rings as revealed by the Cassini Radar*
A. Le Gall, R. West, **L. E. Bonnefoy**, C. Leyrat, M. Janssen, E. Lellouch, and R. Sultana – September 2018, *EPSC 2018*, Berlin, Germany.
 - *Cassini radar and radiometry observations of Saturn's airless icy satellites*
A. Le Gall, R. West, M. Janssen, C. Leyrat, **L. E. Bonnefoy**, and E. Lellouch – December 2017, *AGU fall meeting 2017*, New Orleans, Louisiana, USA.
 - *Holuhraun 2014–2015 Eruption Site in Iceland: A Flood Lava Analog for Mars*
J. Voigt, C. W. Hamilton, S. P. Scheidt, **L. E. Bonnefoy**, I. Jónsdóttir, A. Höskuldsson, and T. Thordarson – September 2017, *EPSC 2017*, Riga, Latvia.
 - *Landscape evolution after the 2014–2015 lava flow at Holuhraun, Iceland*
L.E. Bonnefoy, C. W. Hamilton, S. P. Scheidt, J. Voigt, A. Höskuldsson, I. Jónsdóttir, and T. Thordarson – March 2017, *48th LPSC*, The Woodlands, TX, USA.
 - *Thermal, dielectric and structural properties of Enceladus' leading face*
A. Le Gall, **L. E. Bonnefoy**, C. Leyrat, and M. A. Janssen – October 2016, *48th DPS Meeting*, Pasadena, CA.
 - *Marrying Cassini VIMS and RADAR to extract dune and interdune compositional signatures*
L. E. Bonnefoy, A. G. Hayes, P. O. Hayne, M. J. Malaska, and A. Le Gall – May 2015, *Cornell University Astronomy Department Planetary lunch seminar series*, Ithaca, NY, USA.

Conference posters

- *Evidence of diurnal variations of Titan's near-surface temperature and of a cooling effect of the northern seas from the Cassini radar/radiometer*
A. Le Gall, **L. E. Bonnefoy**, R. Sultana, M. A. Janssen, R. Lorenz, and T. Tokano – September 2020, *EPSC 2020*, online conference.
- *Titan's dunes revealed by the delay/Doppler processing of the Cassini radar altimeter data*
V. Poggiali, M. Mastrogiuseppe, A. G. Hayes, R. Seu, **L. E. Bonnefoy**, J. Mullen, J. I. Lunine – December 2017, *AGU fall meeting 2017*, New Orleans, Louisiana, USA.
- *Remote Sensing Analysis of Askja Pumice Megaripples in the Viksundar, Iceland as an Analog for Martian*

Transverse Aeolian Ridges

S. P. Scheidt, **L. E. Bonnefoy**, C. W. Hamilton, S. Sutton, P. Whelley, and A. P. deWet – May 2017, *5th International Planetary Dunes Workshop, St George, Utah, USA.*

- *The hydrothermal system of the 2014-2015 lava flows at Holuhraun, Iceland: an analog for Martian lava-water interactions*
C. M. Dundas, L. Keszthelyi, C. W. Hamilton, **L. E. Bonnefoy**, S. P. Scheidt, E. Lev, M. E. Rumpf, T. Thordarson, Á. Höskuldsson, I. Jónsdóttir, A. L. Keske, and M. M. Sori – March 2017, *48th LPSC, The Woodlands, TX, USA.*
- *Titan dune composition: constraints from Cassini VIMS and RADAR*
L. E. Bonnefoy, A. G. Hayes, P. O. Hayne, M. J. Malaska, A. Le Gall – October 2014, *Titan Surface Workshop, Ithaca, NY, USA.*